

Claims

- [c1] An overhead area access staircase system for an aircraft comprising:
 - an aircraft overhead module; and
 - a plurality of stair segments that are actuated relative to each other when deployed and are configured to be in proximity with said aircraft overhead module, at least one of said stair segments contacting said aircraft overhead module when deployed, said stair segments comprising;
 - a plurality of step elements; and
 - a plurality of support members coupled to said plurality of step elements.
- [c2] A system as in claim 1 wherein at least one of said plurality of stair segments is coupled to a lining of said aircraft overhead module.
- [c3] A system as in claim 1 wherein said plurality of stair segments are configured to fold onto each other when stowed.
- [c4] A system as in claim 1 wherein said plurality of stair segments comprises:

a first stair segment;
a second stair segment coupled to said first stair segment to rotate in a first direction relative to said first stair segment when deployed; and
a third stair segment coupled to said second stair segment to rotate in a second direction relative to said second stair segment when deployed.

- [c5] A system as in claim 4 wherein said first direction is opposite that of said second direction.
- [c6] A system as in claim 1 wherein at least one of said plurality of stair segments is a non-railing segment.
- [c7] A system as in claim 1 further comprising at least one potential energy device coupled to and assisting stowage of said plurality of stair segments.
- [c8] A system as in claim 1 further comprising at least one potential energy device coupled to and assisting deployment of said plurality of stair segments.
- [c9] A system as in claim 1 further comprising an actuating system coupled to and deploying said plurality of stair segments.
- [c10] A system as in claim 9 wherein said actuating system is operated using at least one operating technique selected

from electrically operated, hydraulically operated, and pneumatically operated.

- [c11] A system as in claim 1 further comprising a lanyard coupled to said plurality of stair segments.
- [c12] A system as in claim 1 wherein said plurality of stair segments are deployable from at least one of said aircraft overhead module.
- [c13] A system as in claim 1 further comprising at least one rail element coupled to said plurality of support members.
- [c14] A system as in claim 13 wherein said at least one rail element comprises a plurality of rail members extending a substantial length of said plurality of stair segments.
- [c15] A system as in claim 13 wherein said at least one rail element has a stowed state and a deployed state.
- [c16] A system as in claim 13 wherein said at least one rail element comprises:
 - a first rail member coupled to a first stair segment; and
 - a second rail member coupled to a second stair segment.
- [c17] A system as in claim 13 wherein said at least one rail element comprises:
 - at least one rail member; and

a plurality of rail actuating elements coupled to and deploying said plurality of railing members.

- [c18] A system as in claim 13 wherein said at least one rail element is coupled to said plurality of support members such that said at least one rail member is actuated into a deployed state when said plurality of stair segments are deployed.
- [c19] A system as in claim 18 wherein said at least one rail member is translated away from and maintains a parallel orientation with said plurality of stair segments when deployed.
- [c20] A system as in claim 13 wherein said at least one rail element is coupled to and translated relative to said plurality of stair segments via a plurality of linkages.
- [c21] A system as in claim 13 wherein said at least one rail member is coupled to at least one hinge and rotates relative to said plurality of stair segments.
- [c22] A system as in claim 13 further comprising an actuating system coupled to and deploying said at least one rail member.
- [c23] A system as in claim 22 wherein said actuating system is operated using at least one operating technique selected

from electrically operated, hydraulically operated, and pneumatically operated.

- [c24] A system as in claim 1 wherein said plurality of stair segments further comprise a plurality of guides coupled to said plurality of support members, said plurality of stair segments translatable relative to each other on said guides.
- [c25] A railing system for an overhead area access staircase system of an aircraft comprising:
 - a plurality of balusters coupled to a plurality of aircraft overhead module stair segments; and
 - at least one rail member coupled to said plurality of balusters;
 - said plurality of balusters and said at least one rail member having a stowed state and a deployed state.
- [c26] A system as in claim 25 wherein said plurality of balusters comprise at least one hinge, said at least one rail member rotatable relative to said plurality of aircraft overhead module stair segments via said at least one hinge.
- [c27] A system as in claim 25 wherein said plurality of balusters simultaneously deploy said at least one rail member with deployment of said plurality of aircraft overhead

module stair segments.

- [c28] A system as in claim 25 wherein said at least one rail element is coupled to and translatable relative to said plurality of aircraft overhead module stair segments via a plurality of linkages.
- [c29] An aircraft comprising:
 - an aircraft overhead module; and
 - at least one overhead area access staircase system comprising;
 - a plurality of stair segments that are actuated relative to each other when deployed and configured to be in proximity with said aircraft overhead module, at least one of said stair segments contacting said aircraft overhead module when deployed, said stair segments comprising;
 - a plurality of step elements; and
 - a plurality of support members coupled to said plurality of step elements.
- [c30] An aircraft as in claim 29 wherein said at least one overhead area access staircase system comprises at least one rail element coupled to said plurality of stair segments.
- [c31] An aircraft as in claim 29 wherein said plurality of stair segments are configured to fold onto each other when stowed.

- [c32] An aircraft as in claim 29 wherein said plurality of stair segments comprises:
 - a first stair segment;
 - a second stair segment coupled to said first stair segment to rotate in a first direction relative to said first stair segment when deployed; and
 - a third stair segment coupled to said second stair segment to rotate in a second direction relative to said second stair segment when deployed.
- [c33] An aircraft as in claim 29 further comprising at least one rail element coupled to said plurality of support members.
- [c34] A method of accessing an overhead area of an aircraft comprising:
 - opening an aircraft overhead module;
 - releasing an overhead area access staircase system having a plurality of stair segments;
 - unfolding said plurality of stair segments; and
 - ascending said plurality of stair segments.
- [c35] A method as in claim 34 further comprising deploying at least one rail member.
- [c36] A method as in claim 35 wherein unfolding said plurality of stair segments and deploying at least one rail member

are performed simultaneously.

- [c37] A method as in claim 34 further comprising actuating at least one rail member relative to said plurality of support members.
- [c38] A method as in claim 34 further comprising providing hand support for ascending said plurality of stair segments.
- [c39] A method as in claim 34 wherein releasing said overhead area access staircase system comprises unlocking said plurality of stair segments.
- [c40] An overhead area access staircase system for an aircraft comprising:
 - an aircraft overhead module;
 - a plurality of stair segments coupled to fold onto each other, having a stowed state and a deployed state, coupling said aircraft overhead module when deployed, and comprising;
 - a plurality of step elements; and
 - a plurality of support members coupled to said plurality of step elements; and
 - at least one railing member coupled to and deployable with said plurality of stair segments.